

Toshiba TECHNICAL DATA

ELECTRON TUBE

14527E

E 23 The Toshiba 14527E is a fixed frequency pulsed-type magnetron intended for use in radar systems.

The peak power output is 6 kilo-watts in the frequency region between 9345 and 9405 MHz.

The tube is an integral magnet type and is cooled naturally or by forced air.

The output fitting is designed to mate with a waveguide.

GENERAL DATA

Electrical:

Frequency	9375 $\pm$ 30	MHz
Heater voltage	6.3	V
Heater current	0.52	A
Cathode preheating time	130	sec

Mechanical:

Dimensions	See outline drawing
Base and electrical connection	See outline drawing
Mounting position	Any
RF Coupling	See outline drawing
Magnetic field	Integral
Cooling	Forced air or natural
Net weight	1.0 kg approx.
Type of cathode	Oxide unipotential

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Toshiba Electronics

4M527E

MAXIMUM RATINGS

	Minimum	Maximum	
Heater voltage (preheat)	5.0	7.0	V
Cathode preheating time	120	-	sec
Heater voltage (operate)	See drawing		
Peak anode voltage	4.2	5.0	kV
Peak anode current	3.0	5.0	A
Average anode current	-	10.0	mA _{dc}
Peak anode power input	-	25	kW
Average anode power input	-	50	W
Pulse duration	0.1	2.5	us
Duty cycle	-	0.0025	
Load VSWR(See outline drawing for measurement point) -		15	
Anode temperature(See outline drawing for measurement point)	-	120	C

TYPICAL OPERATION 1

Frequency	9375	9375	MHz
Heater voltage (operate)	6.3	5.3	V
Peak anode voltage	4.6	4.6	kV
Peak anode current	4.5	4.5	A
Average anode current	0.9	9	mA _{dc}
Pulse width	0.1	1	us
Pulse repetition rate	2000	2000	pps
Duty cycle	0.0002	0.002	
Peak power output	6.0	6.0	kW
Average power output	1.2	12	W
RF bandwidth	20	2	MHz
Pulling factor (load VSWR 1.5) -	12	12	MHz
Cooling quantity (forced air)	-	800	/min

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TOSHIBA ELECTRON TUBE DATA

1M527A

TYPICAL OPERATION 2

Frequency	9375	9375	kHz
Heater voltage (operate)	6.3	5.5	V
Peak anode voltage	4.5	4.5	kV
Peak anode current	3	3	A
Average anode current	0.6	6	mA dc
Pulse width	0.1	1	μs
Pulse repetition rate	2000	2000	pps
Duty cycle	0.0002	0.002	
Peak power output	3	3	kw
Average power output	0.6	6	W
RF bandwidth	20	2	MHz
Pulling factor (load VSWR 1.5)	12	12	MHz
Cooling quantity (forced air)	-	800	l/min

Toshiba TECHNICAL DATA

ELECTRON TUBE

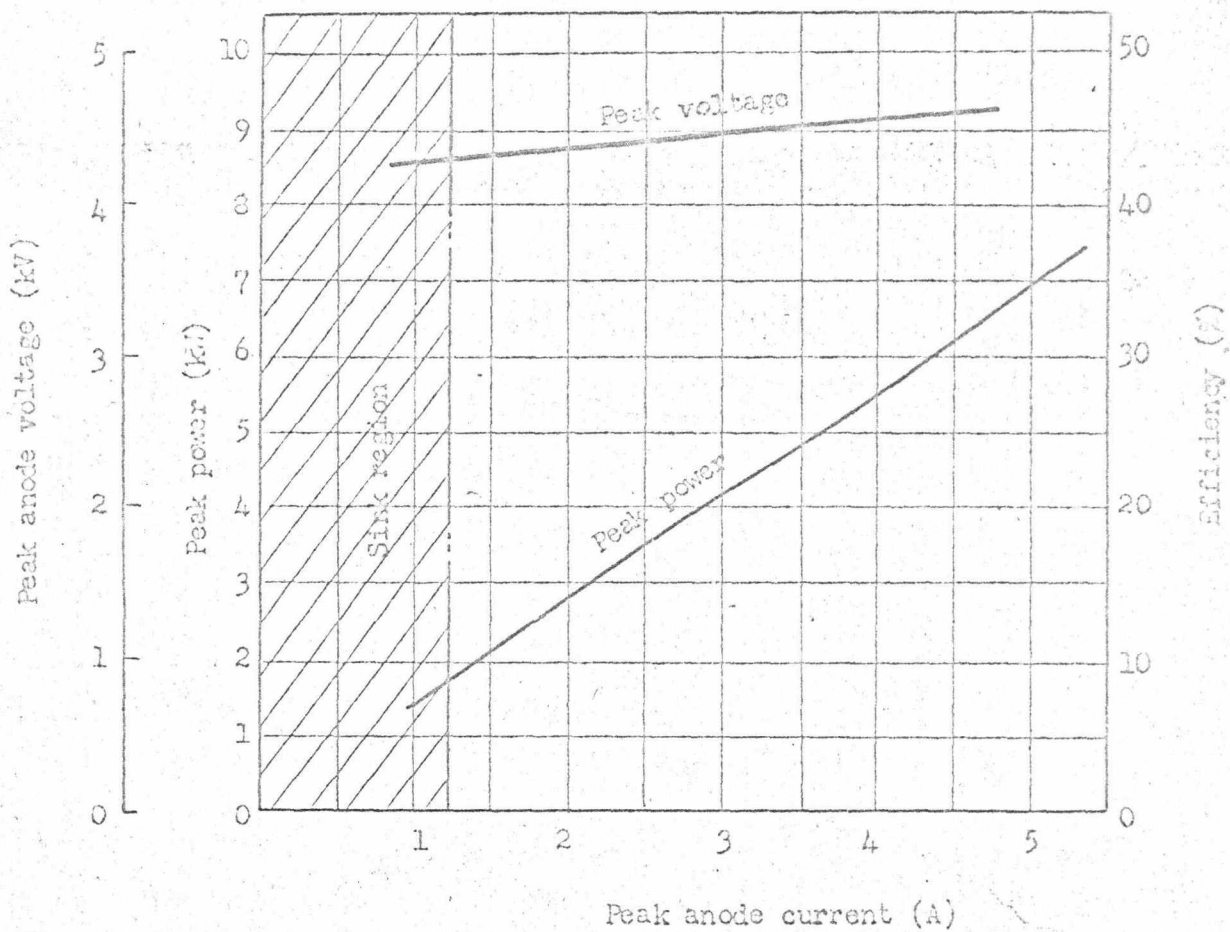
10-2130-11-217-2-23

2A5275

OPERATING CHARACTERISTICS

Operating condition

Frequency :	9375	Hz
Pulse width :	1	μ s
Duty :	0.002	
VSWR :	1.1	Max.

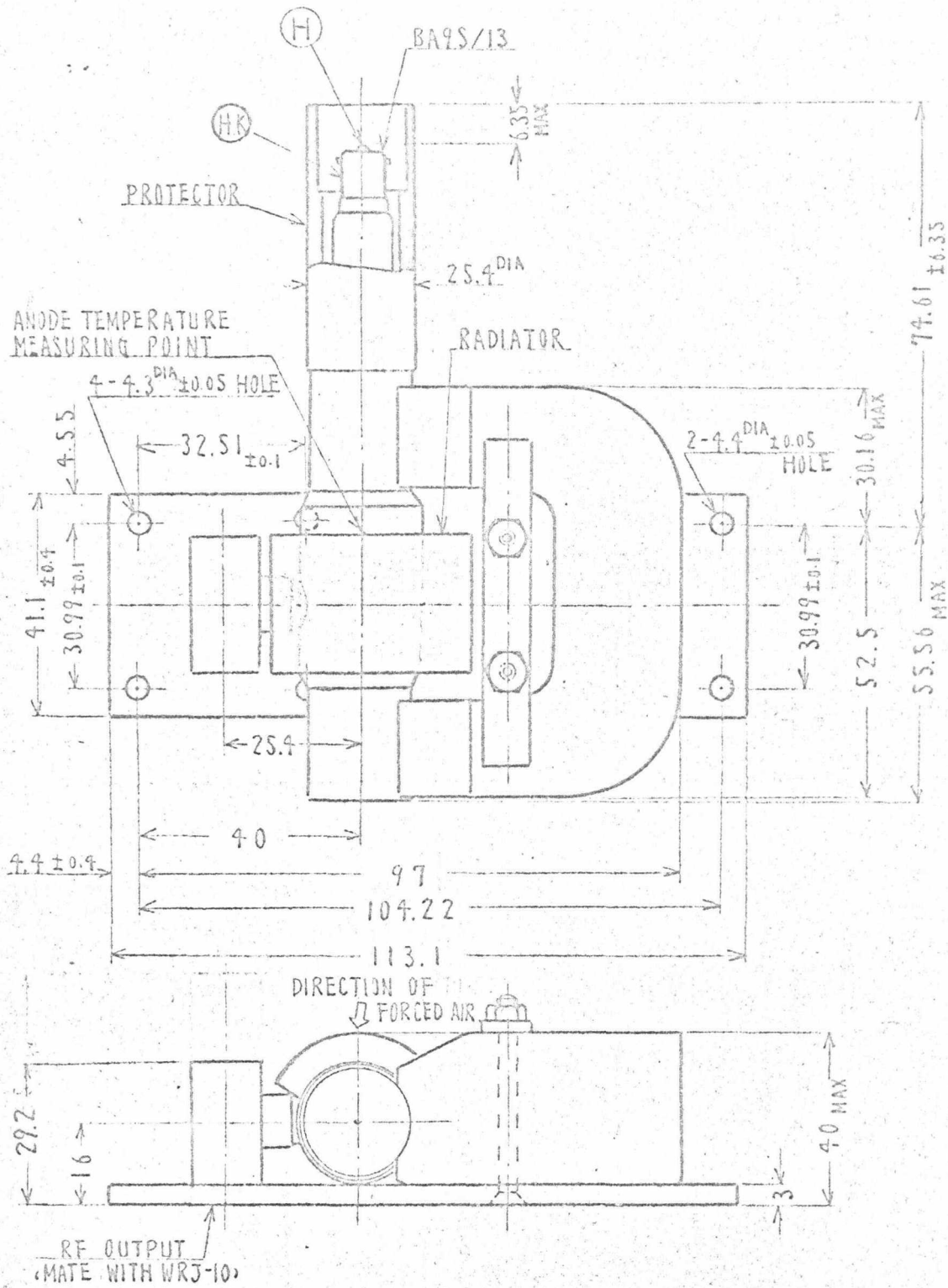


YOSHIDA TECHNICAL DATA

ELECTRON TUBE

OUTLINE DRAWING

Unit mm



Toshiba TECHNICAL DATA

ELECTRON TUBE

4A5276

LIFE TEST DATA

(Tube No. 47037)

Operating condition

Heater voltage(preheat): 6.3 V

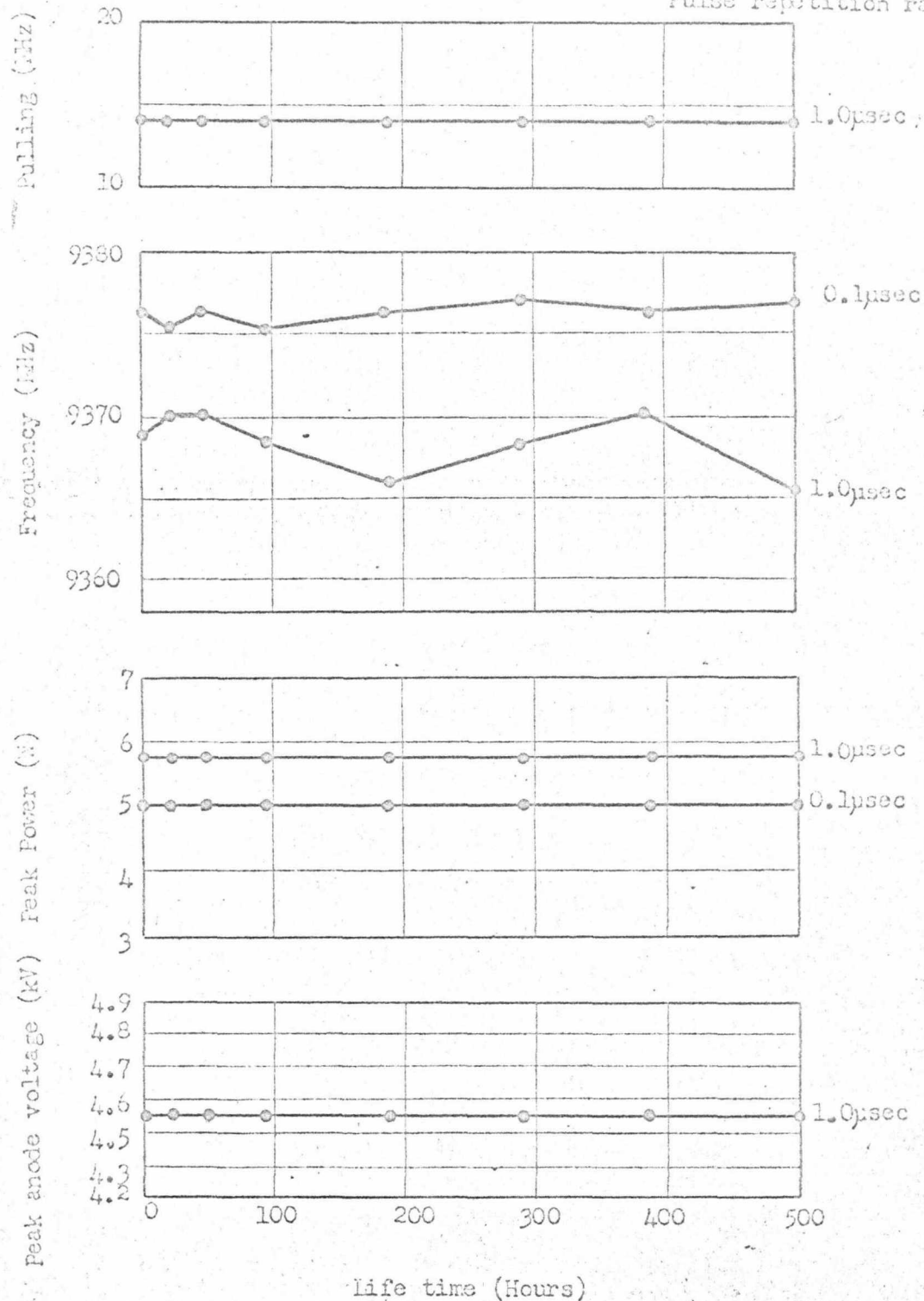
Heater voltage(operate): 5.5 V

Pulse duration : 1 μ sec

Duty cycle : 0.002

Peak anode current : 4.5 A

Pulse repetition rate : 2000 pps



May. 11, 1971

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EM-M4 527E-4.a

Toshiba TECHNICAL DATA

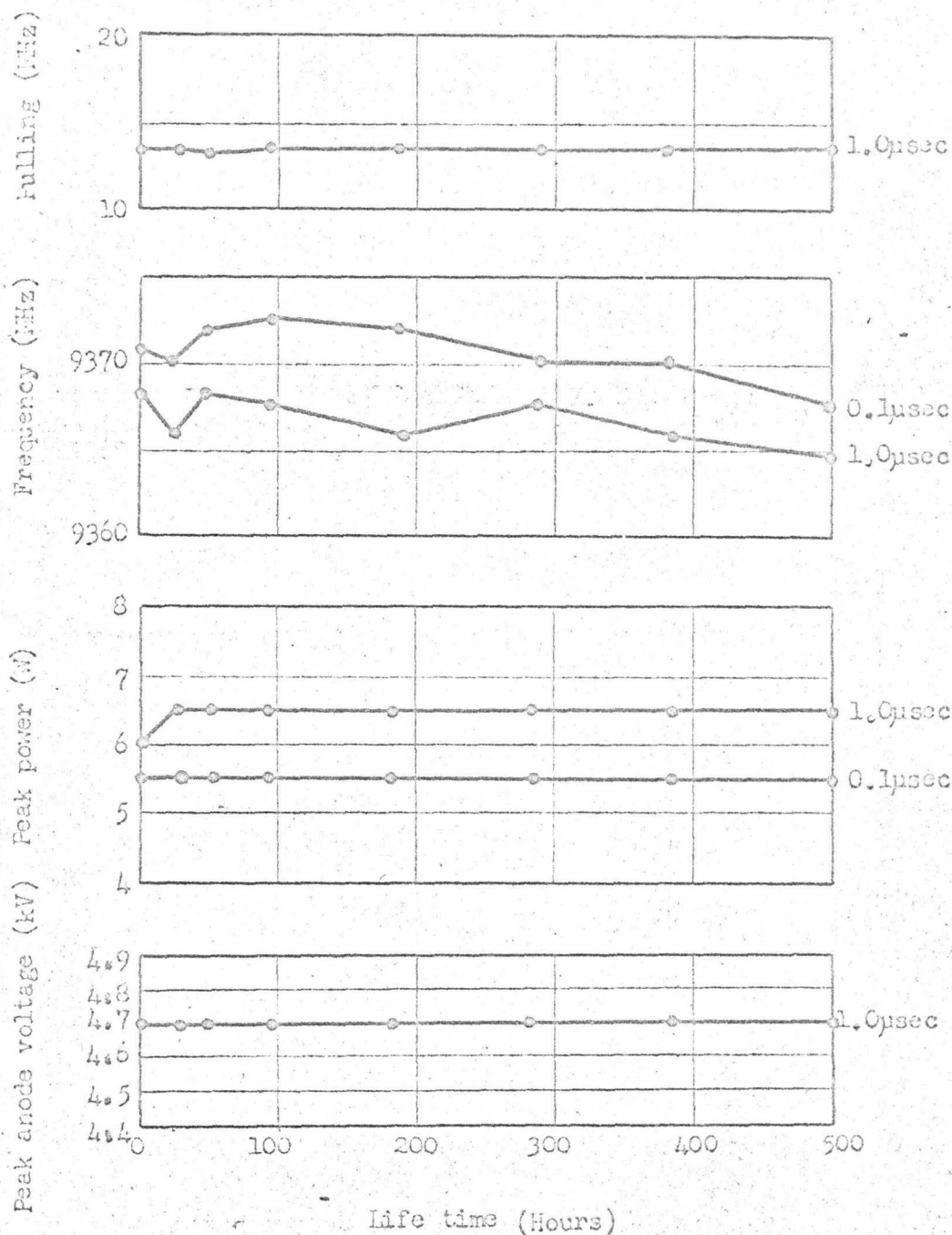
ELECTRON TUBE

1M5273

LIFE TEST DATA (Tube No. 80012)

Operating condition

Heater voltage (preheat): 6.3 V
 Heater voltage (operate): 5.3 V
 Pulse duration: 1 μ sec
 Duty cycle: 0.002
 Peak anode current: 4.5 A
 Pulse repetition rate: 2000 pps



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EM-M4527E-4b

Toshiba TECHNICAL DATA

ELECTRON TUBE

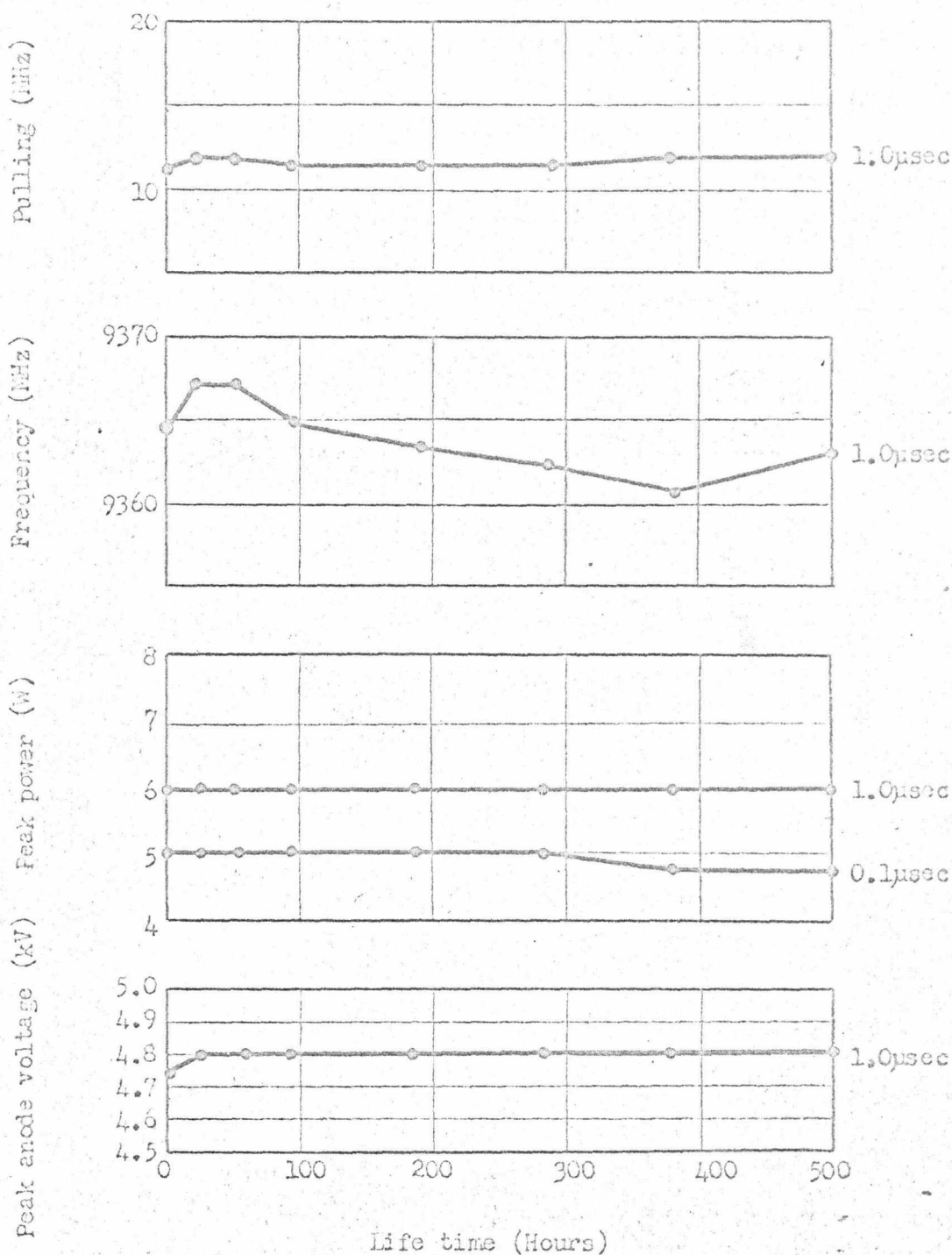
N45273

LIFE TEST DATA

(Tube No. 86102)

Operating condition

Heater voltage(preheat): 6.3 V
 Heater voltage(operate): 5.3 V
 Pulse duration : 1 μ sec
 Duty cycle : 0.002
 Peak anode current : 4.5 A
 Pulse repetition rate : 2000 pps



May. 11, 1971

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EX-N4527E-4c

Toshiba TECHNICAL DATA

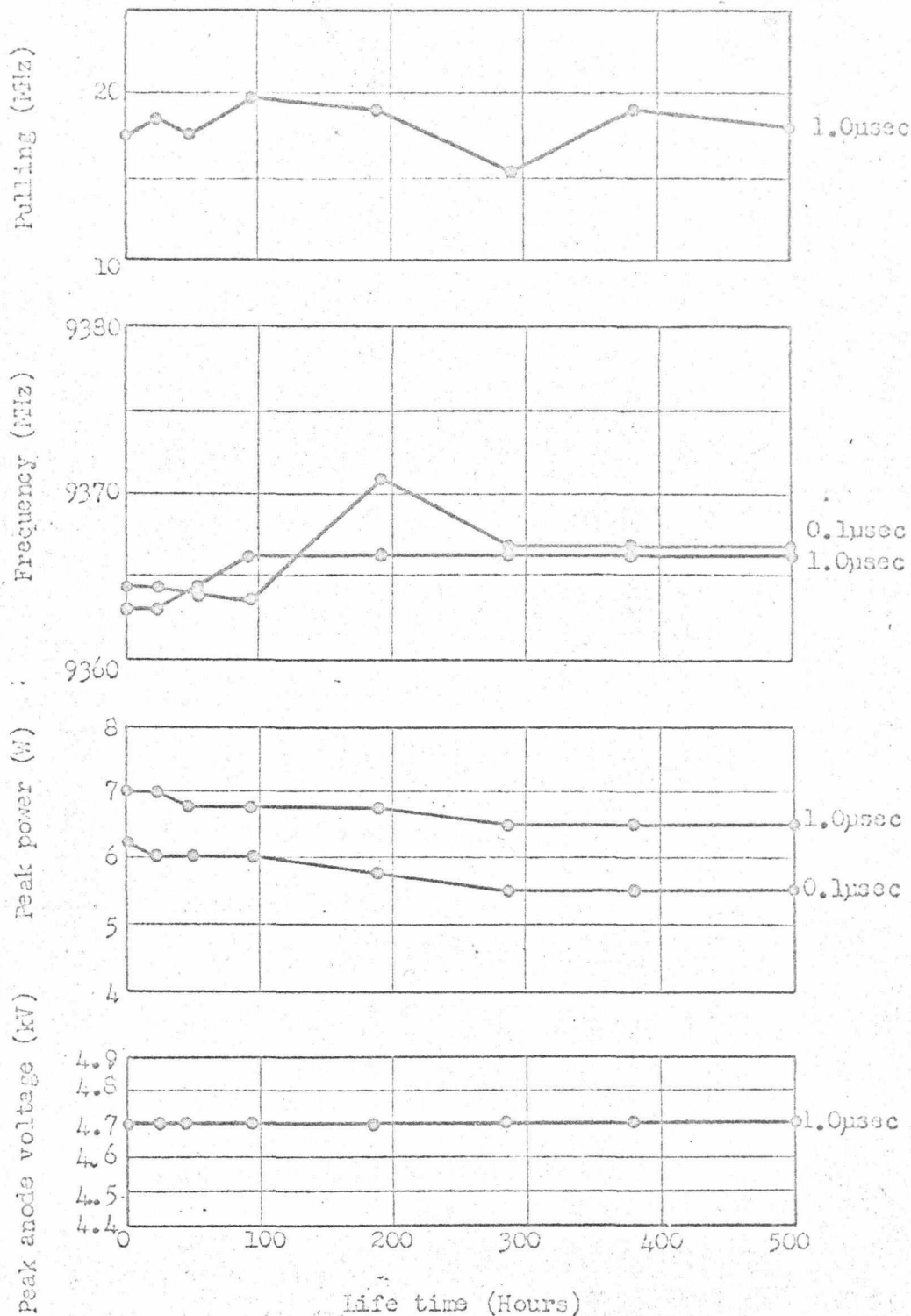
ELECTRON TUBE

LIFE TEST DATA

(Tube No. 92058)

Operating condition

Heater voltage (preheat) : 6.3 V
 Heater voltage (operate) : 5.3 V
 Pulse duration : 1 μ sec
 Duty cycle : 0.002
 Peak anode current : 4.5 A
 Pulse repetition rate : 2000 pps



May. 11, 1971

TOKYO SHIBAURA ELECTRIC CO., LTD.

EM-M4527E-4d

M4527E											
DESCRIPTION	Magnetron(Fixed frequency, Integral magnet, Forced air cooled)										
FUNCTION	Band pulsed oscillation										
OUTER DIMENSION	9370MHz See attached drawing										
MAXIMUM RATINGS	Term	Ef	Ib	Pi	Du	tp	Note5 IfV	Note2 tk	$\sqrt{f}$ L	Note6 tp	Magnet Separation
	Unit	V	A	W	---	μ s	KV/ μ s	sec	---	C	cm
	Max	7.0	5.0	50	0.0025	2.5	75	---	1.5	120	---
	Min	---	---	---	---	---	---	180	---	---	5
TEST CONDITION	--- -- -- -- -- 75Min 120 1.1Min --- --Note 1,2										
TEST SPECIFICATION											
TEST TERM		TEST METHOD	TEST CONDITION	SYMBOL	BOGIE	LIMIT		UNIT			
						MIN	MAX				
*Packing		6.2	Container drop	---	---	---	---	---			
*Vibration		5.4.1.1		---	---	---	---	---			
*Vibration		5.4.1.2		---	---	---	---	---			
Heater current		4.1	Ef=6.3V	If	0.52	0.43	0.60	A			
OPERATION (1)	Peak Anode Voltage	8.1.1(1)	Ef=(Preheat)=6.3V;	sb	4.6	4.4	4.8	KV			
	Average Power	8.1.1(2)	Ef=(Operation)=5.3V tp=0.9~1.1 μ s; Du=0.002	Po	---	10	---	W			
	Frequency	4.7.1	Ib=9mA dc; t=300sec Max	f	9375	9345	9405	MHz			
	Stability	8.1.5(1)	Note 7	M.F.	---	---	15	%			
	Band Width	8.1.2	Ib=7~9 mA dc	fbw	---	---	2.5/tp	MHz			
	Minor lobe			---	---	6	---	dB			
	*Pulling Factor	8.1.3	ϕ L=1.5;	fpl	---	---	15	MHz			
	*Temperature Coefficient	5.7.1	Tp=40~70 °C;	TC	---	0.25	---	MHz/°C			
OPERATION (2)	Band Width	8.1.2	Ef(Preheat)=6.3V; Ef(Operation)=6.3V	fbw	---	---	2.5/tp	MHz			
	Minor Lobe		tp=0.1~0.15 μ s; fp=100~200 pps	---	---	6	---	dB			
		8.1.5(1)	Ib=4.5A; Note 7	M.F.	---	---	0.25	%			
*VSWR				ρ	---	8	---	---			
*First Standing Wave Minimum		8.2	Note 4	l	4	1	7	mm			

Note 1 Reduce heater voltage according to the following formula when anode input power is over 25 watts.

$$E_f = 6.3(1 - P_i/180) \text{ (V)}$$

- 2 tk=120 sec Min, when ambient temperature is above 0°C, and
tk=180 sec Min, when between 0°C and -55°C.

- 3 Holding period 168 hours Min.
- 4 Measure the nearest measurable standing wave minimum and calculate the distance of first standing wave minimum from the output flange.
- 5 The rate of rise of voltage (rrv) is defined by the steepest tangent to the leading edge of the voltage pulse above 80 percent amplitude. Any capacitance used in viewing system shall not exceed 6.0pF.
- 6 See outline drawing for anode temperature measuring point.
- 7 Measure stability in terms of the number of output pulses missing expressed as a percentage of the number of input pulses applied during the period of observation. Pulses are considered "missing" if due to any cause, their RF energy is less than 70% of the normal energy level between 9345 and 9405 MHz. The missing pulse shall not exceed the amount specified during any 5 minute interval of a 15 minute test period.
- 8 "*" for design test.